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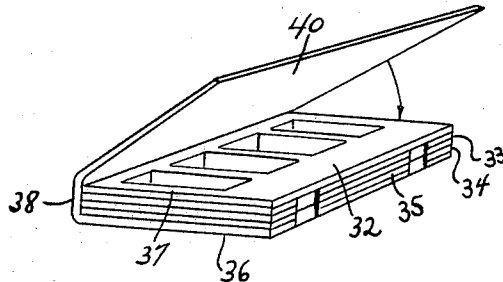
[56] **References Cited**
UNITED STATES PATENTS
 2,077,570 4/1937 Lamarg (206/72UX)
 2,761,558 9/1956 McLean, Jr. 206/72X
 3,448,913 6/1969 Wolff 229/14

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[54] **COMPOSITE SPACER AND LINER MEMBER FOR SHIPPING CONTAINERS**
4 Claims, 15 Drawing Figs.

[52] U.S. Cl. **229/14, 206/72**
 [51] Int. Cl. **B65d 5/56**
 [50] Field of Search **206/72, 73; 229/8, 14 (B), 14 (BA), 14 (DL)**

ABSTRACT: A foldable, multiply article spacer, and liner member produced from a cut-and-scored blank and comprising a series of apertured article spacer panels foldable into a stack with the apertures in registry, a liner panel connected to and foldable upon an end spacer panel in the stack and mechanical fastener means securing together a common side of the panels in the stack.



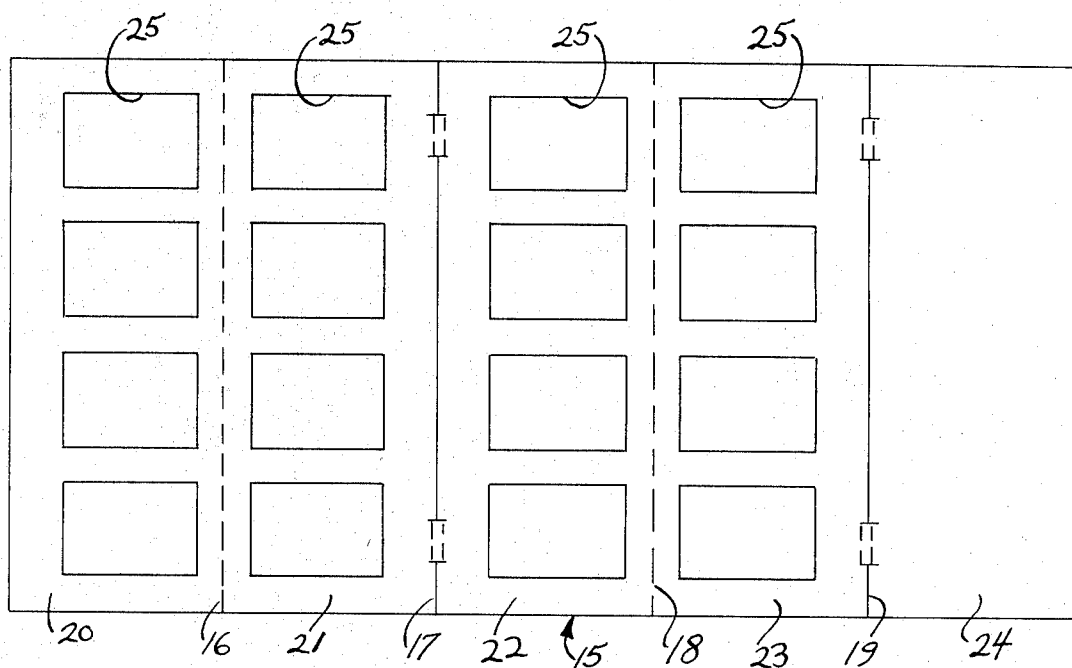


Fig. 1

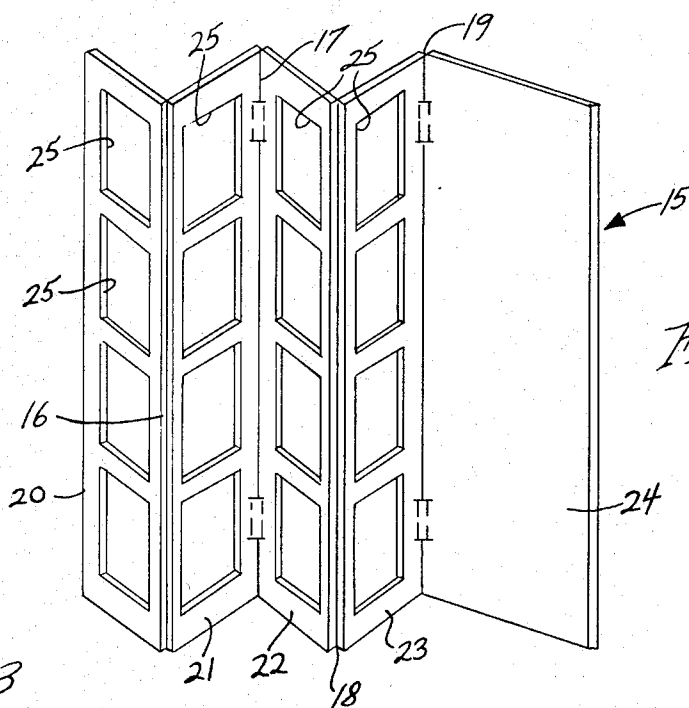


Fig. 2

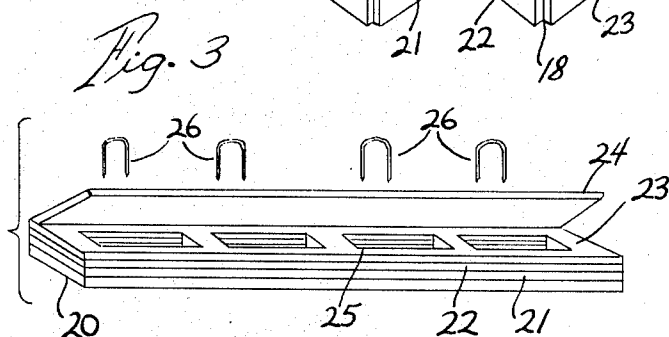


Fig. 3

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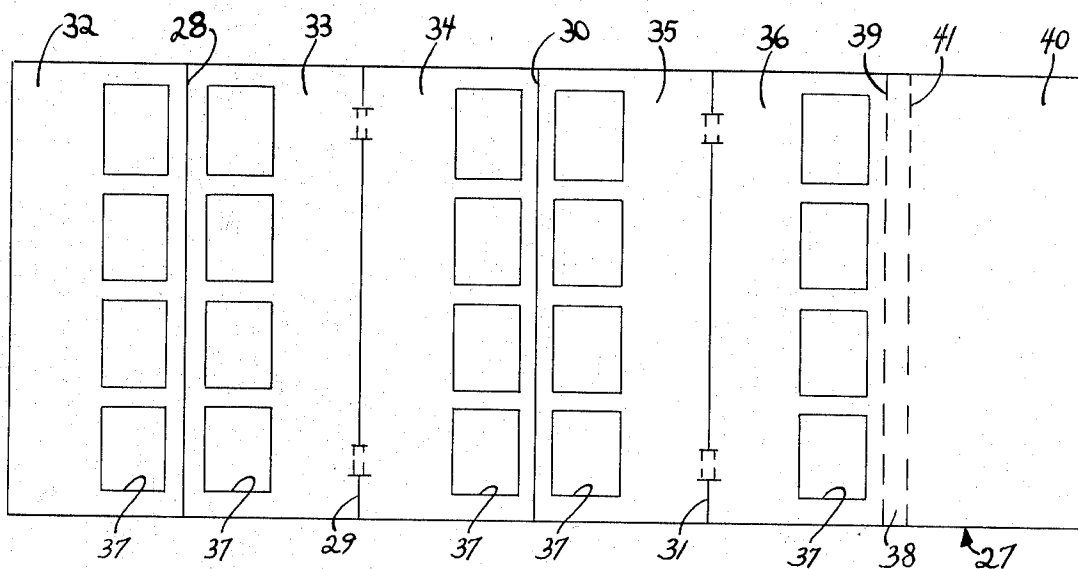


Fig. 4

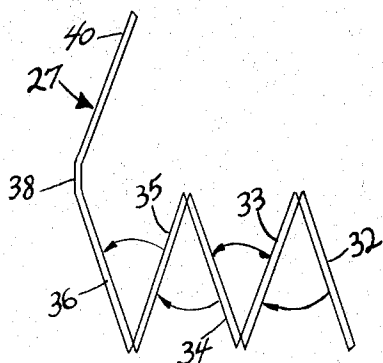


Fig. 6

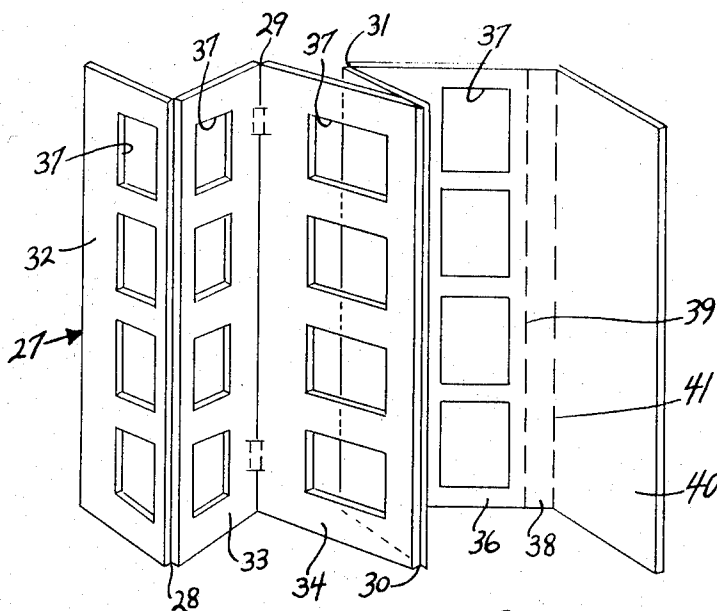


Fig. 5

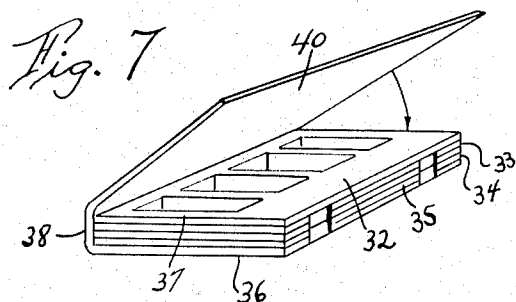


Fig. 7

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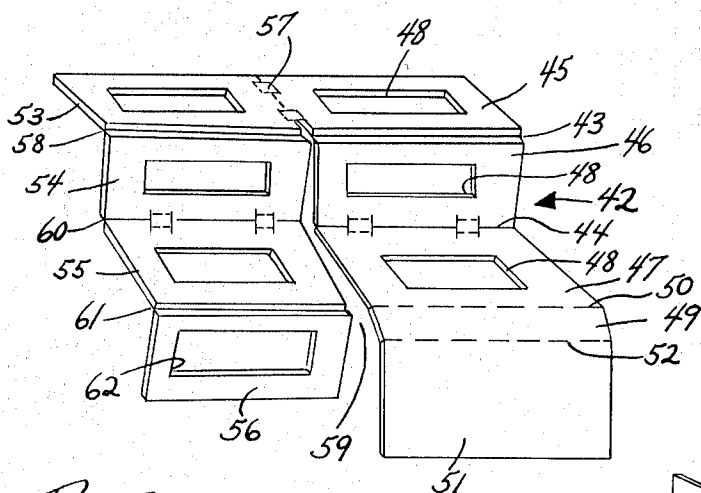


Fig. 8

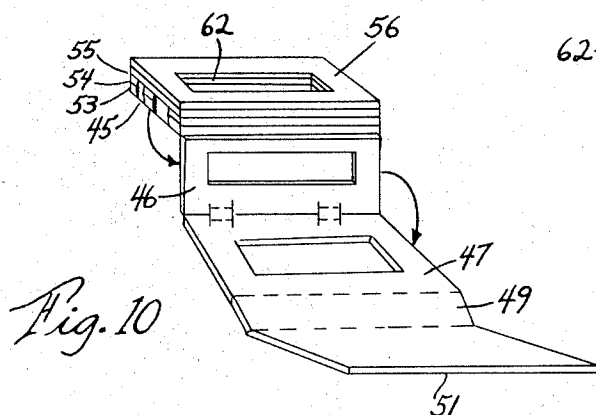


Fig. 10

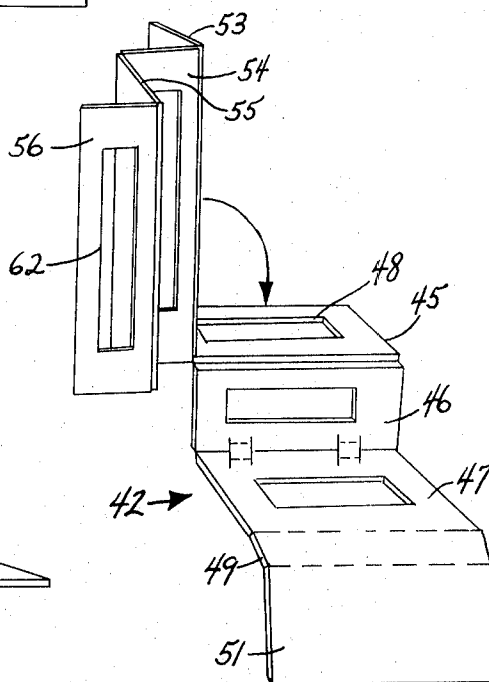


Fig. 9

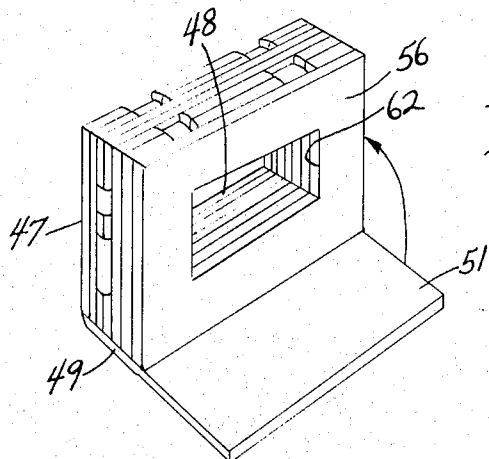


Fig. 11

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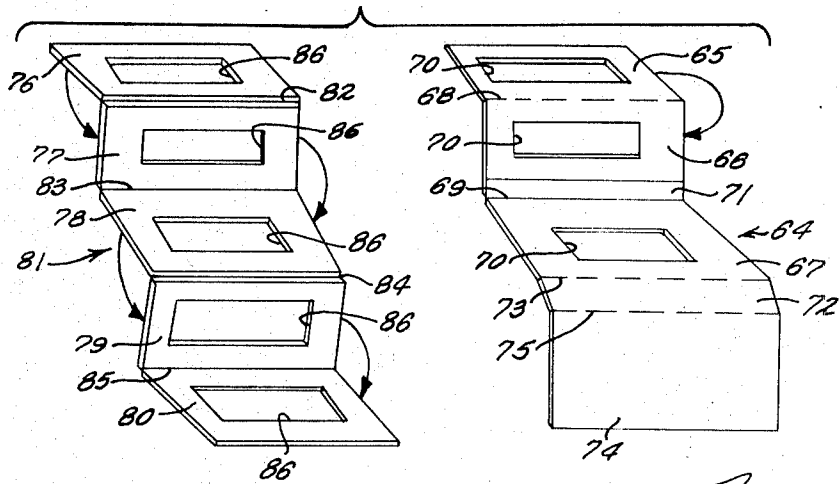


Fig. 12

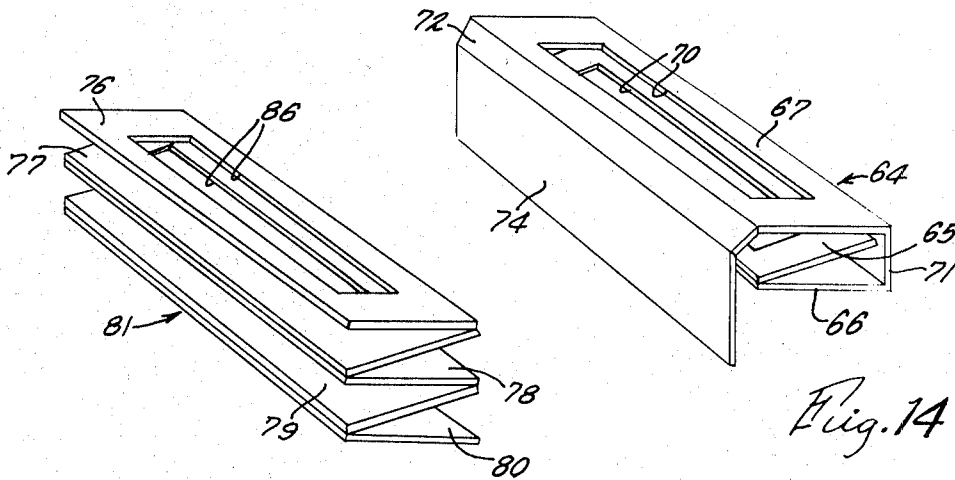


Fig. 13

Fig. 14

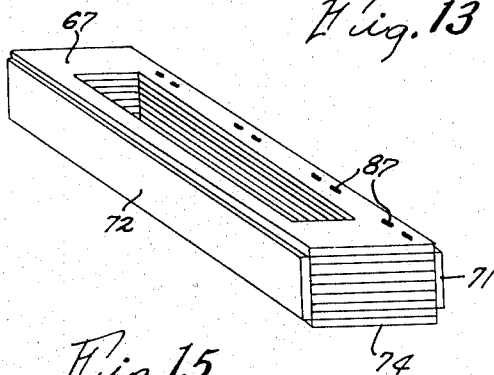


Fig. 15

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COMPOSITE SPACER AND LINER MEMBER FOR SHIPPING CONTAINERS

The present invention relates to article positioning members for shipping containers and is particularly directed to a novel blank readily foldable into a composite, multiply liner and spacer member having a simple fastening means that binds the plies into a rigid and strong unitary structure.

It has become the practice to ship hardware items like fluorescent tube fixtures, and the like, in corrugated paper board cartons and to protect said items from damage by liner and spacer members insertable into the carton ends to hold the items in spaced apart positions with respect to the walls and closures of the cartons. These liner and article spacer members were composed of individual plies cut and blanked out and then separately run through a gluing machine, stacked in suitable numbers and left to dry in a press. Manifestly this procedure required considerable handling of the separate blanks and added materially to the cost of these liner and spacer members. It is therefore a particular object of this invention to provide a simplified and economical liner and spacer member structure that will materially reduce its handling during manufacture and considerably reduce the cost of the finished member.

Another object of the invention is to provide a die-cut and scored blank that may be folded and fastened to produce a multiply packing member insertable into the end of a shipping container to provide a combined liner and spacer for articles to be shipped in the container.

A further object of the invention is to provide a strong spacer and liner member that is economically formed from corrugated paper board material simply blanked out, die-cut, scored and readily folded and fastened for assembly into a suitable shipping container.

With these and other objects in view my invention will be more fully described and set forth in the following specification, taken in conjunction with the accompanying drawings and particularly pointed out in the appended claims:

In the drawings:

FIG. 1 is a plan view of a blanked out and scored liner and spacer member prior to its being folded to form the preferred embodiment of my invention.

FIG. 2 is a perspective view of the member in an intermediate folded position.

FIG. 3 is an exploded, perspective view of the member shown in FIGS. 1 and 2 just prior to its final fastening step.

FIG. 4 is a plan view of a modified form of my liner and spacer member.

FIG. 5 is a perspective view of the member shown in FIG. 4 in an intermediate folded position.

FIG. 6 is an end view of the member shown in FIG. 5.

FIG. 7 is a perspective view of the member shown in FIGS. 4-6, depicting its final folding step prior to being fastened together.

FIGS. 8, 9 and 10 are perspective views of another modified form of my member shown in intermediate, consecutive stages of its folding operation.

FIG. 11 is a perspective view of the member shown in FIGS. 8-10, depicting its final folding step prior to being fastened together.

FIGS. 12, 13 and 14 are perspective views of still another modification of my member shown in intermediate stages of its folding operation.

FIG. 15 is a perspective view of the member shown in FIGS. 12-14 in its finished condition.

Referring in detail to FIGS. 1-3 of the drawings the numeral 15 indicates a blank of corrugated board, either single or double ply, that has formed therein equally spaced apart lateral score lines 16, 17, 18 and 19 to form a side-by-side, longitudinal series of die-cut spacer panels 20, 21, 22 and 23 and an end liner panel 24. The spacer panels have article engaging holes 25 formed therethrough that are die-cut in the

several panels to be in registry when the blank is in its folded up, panel stacked condition. The number of holes in each lateral row and their shapes will vary according to the number and shapes of the articles to be supported by the member within a suitable shipping container. It is contemplated that the score lines 16, 17, 18 and 19 may be any one of a number of kinds such as slits, scored, perforated scored, conventional scored, hinge scored or crease lined.

As best shown in FIG. 2 the spacer panels and the liner panel are reversely folded into the folded up, stacked position shown in FIG. 3, the folded up panels being fastened together as by a lateral row of spaced apart staples 26 driven through common lateral edge portions of all of the panels and permanently clinched in the usual manner to form a composite spacer and liner member. Other forms of fasteners may be used to secure together the folded panels to make the composite spacer liner member such as glue, commercial adhesive tapes, and the like. Staples are preferred in that their ease and facility of application by conventional stapling machines is most economical and they are the strongest and most dependable of the fasteners mentioned. The finished spacer and liner members have generally a marginal configuration identical with the inside cross-sectional form of the particular shipping carton for which they were made and the aligned openings in the spacer panels have the outer end shape of the particular item to be packaged in said shipping containers, it being understood that a spacer and liner member is first applied to each end of the item and the item with the members attached is then slipped into the particular shipping container for packaging and shipment.

Now with reference to FIGS. 4-7 of the drawings a blank 27 is provided with equally spaced apart, lateral score lines 28, 29, 30 and 31 to form a side-by-side, longitudinal series of spacer panels 32, 33, 34, 35 and 36, each having one or a series of articles engaging holes 37 formed therethrough which in panel folded up condition are in registry. The panel 36 is connected to a narrow edge panel 38 by a lateral score line 39 while the other side of the narrow panel is connected to a liner panel 40 by a lateral score line 41.

As indicated in FIGS. 5 and 6 the spacer panels are reversely folded along common score lines upon each other, the edge panel 38 being folded across one edge of the folded up spacer panels and the liner panel 40 being then folded down upon the stack of panels. A lateral row of staples (not shown) is then driven through the edge portions of all the panels opposed to the edge panel 38 to fasten the spacer and liner member into a composite unit ready for insertion into a shipping carton to support an article therein.

When it is required to construct a relatively thick and extra strong spacer and liner member a blank 42, illustrated in FIGS. 8 and 9 of the drawings, is thought to be economical of material and rugged enough to meet optimum packing specifications. The blank 42 has equally spaced apart, lateral score lines 43 and 44 formed therein to provide a first longitudinal series of spacer panels 45, 46 and 47, each having one or a lateral series of die-cut holes 48 therethrough that are in registry when the panels are folded upon themselves. A narrow edge panel 49 is connected to the panel 47 by a lateral score line 50 while a liner panel 51 is connected to the narrow panel by a lateral score line 52. A second longitudinal series of spacer panels 53, 54, 55 and 56 are disposed beside the panels 45-47, 49 and 51 in the blank, the panel 53 being hingedly connected to the panel 45 by a longitudinal score line 57 and connected to the panel 54 by a lateral score line 58. Panels 54-56 are separated in the blank from the panels 46, 47, 49 and 51 by a slit 59. A lateral score line 60 is formed between panels 54 and 55 while a lateral score line 61 is formed between the panels 55 and 56. The panels 53, 54, 55 and 56 have die-cut holes 62 therein which in folded up position of the member register with all the other holes 62 and the holes 48.

As indicated in FIGS. 9 and 10 the panels 53, 54, 55 and 56 are first folded together and then the said folded up panels are

folded upon the panel 45 whereafter the panels 45, 46 and 47 are folded upon themselves, the edge panel 49 being folded upon an edge of the panel stack and the spacer panel 51 folded upon the stack. A line of staples, or the like, (not shown) are then run through the common lateral edges of all of the panels that are opposed to the edge panel 49 to secure the folded up spacer and liner member together.

At times the maximum rule of a particular die press is not large enough to accommodate a blank like that illustrated in FIGS. 8—11 of the drawings and it then becomes necessary to construct the spacer and liner member of two or more parts. This feature of my invention is illustrated in FIGS. 12—15 of the drawings wherein the reference numeral 64 is a cut and scored blank having a first longitudinal series of spacer panels 65, 66 and 67 formed by lateral score line 68 and 69, each panel having an article receiving hole 70 formed therein which are in registry when the said panels are folded into parallel relationship. A relatively narrow edge panel 71 is interposed between the spacer panels 66 and 67 and a wider edge panel 72 is connected to the liner panel 67 by a lateral score line 73; a liner panel 74 being connected to the edge panel 72 by a lateral score line 75. A separate and second longitudinal series of spacer panels 76, 77, 78, 79 and 80 are formed from a die-cut individual blank 81 and are divided by lateral score lines 82, 83, 84 and 85; each panel having an article receiving hole 86 therein which are die-cut to be in registry with each other and with the holes 70 in the first series.

The spacer and liner member is formed by first folding the panels of the second series (FIG. 13) upon themselves into a stack and then folding the panels of the first series (FIG. 14) into parallel positions wherein the panel 67 is spaced away from the liner panel 74 by the edge panel 72 a distance equal to the folded up thickness of the second series and the folded panels 65 and 66 are spaced in parallelism from the panel 67 by the edge panel 71 by approximately the same distance. It is then only necessary to insert the folded up second series of panels into the space between the spacer panels 65 and 67 to align the article receiving holes and then run a lateral line of staples 87 (FIG. 15) through the common edges of all the

panels that are opposed to the edge panel 72 to complete the composite spacer and liner member.

It should be understood that the present disclosure is for illustrative purposes only and that this invention includes modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. A foldable, multiply article spacer and liner member produced from a cut-and-scored blank assembled and fastened prior to assembly into a shipping container, the invention that consists of a number of spacer panels having identical marginal dimensions and disposed in a regular stack, adjacent panels being connected together by a lateral hinge line and folded upon each other, an article receiving aperture formed through each spacer panel, the apertures of the spacer panels being in registry in the stack, a narrow edge panel hingedly connected to a free lateral side edge of an outermost spacer panel in the stack, the edge panel having a width dimension that spans the common lateral edges of the stacked spacer panels on one side of the stack, an imperforate liner panel having substantially the outside marginal dimensions of the spacer panels and hingedly connected to the free lateral side of the edge panel, said liner panel being foldable onto the opposite outermost spacer panel in the stack, and panel fastening means disposed along the side edge of the stack opposed to the edge panel.

2. A foldable, multiply article spacer and liner member set forth in claim 1 wherein the fastening means is a lateral row of spaced apart staples run through and clinched to all the panels.

3. A foldable, multiply article spacer and liner member set forth in claim 1 wherein all but two adjacent panels in the stack are connected together by a lateral hinge line.

4. A foldable, multiply article spacer and liner member set forth in claim 1 wherein a second series of stacked spacer panels is interposed in the stack, the end panel in the stack being hingedly connected to the end spacer panel of the second series only by a longitudinal fold line.

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